By **Manfred Plagmann**, *BRANZ Senior Physicist*

Vents in skillion roofs

Some roof designs, such as skillion roofs, must include ventilation to manage roof moisture. Recent BRANZ research provides advice on the best place for effective vent openings in low wind zones.

IN HIGH WIND zones, the placement of vents in metal and tile clad skillion roofs might not be critical. But what about in low wind zones, particularly during winter?

Looking for answers

A BRANZ project set out to answer some common questions on skillion roof ventilation. We knew openings for roof ventilation must be included, but is vent placement important? Does vent placement make a difference to ventilation performance?

A skillion roof with tiles and profiled metal has very limited airflow space between the purlins and insulation because the air gap is only about 25 mm. What does the airflow pattern look like near the purlins of a metal roof and should that be improved? If so, how?

Skillion roof airflows modelled

Airflow simulations were carried out for a monopitch skillion roof with profiled metal roofing, with and without eaves. The building in the model has a 12 m long roof with 300 mm deep eaves. The dimensions of the building are not critical and chosen only to show the effect. Similar results would be observed with different dimensions. All simulations shown are based on a wind profile with a wind speed of 2 m/s at a reference height of 10 m.

Figures 1a and b show the air pressures on a skillion roof, with and without eaves, obtained from a computer fluid dynamics simulation. The white area is the cross-section of the building. The pressure is indicated by the rainbow going from dark red for high positive pressure to dark blue for high negative pressure.

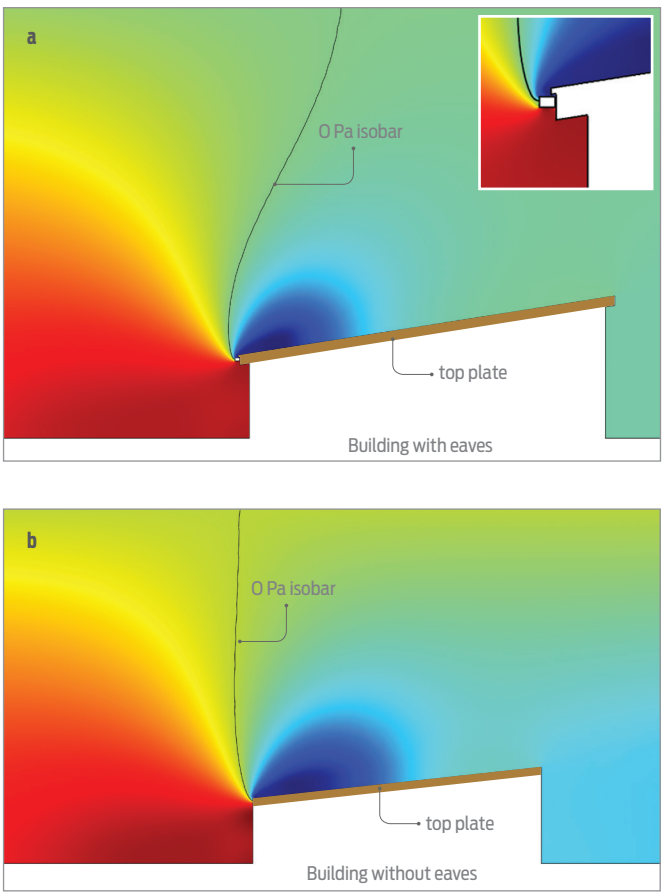

Figure 1: Air pressures on a monopitch skillion roof, (a) with and (b) without eaves. Dark red is high positive pressure, dark blue is high negative pressure.